

Influenza Surveillance in Pennsylvania

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DURING the summer of 1968, a major antigenic change in the A₂ influenza virus was documented through isolations of virus during epidemics in the Far East. In a special session in September 1968, the Public Health Service Advisory Committee on Immunization Practices indicated that the change in the influenza virus increased the probability of a significant outbreak of influenza during the winter of 1968–69 and noted that the true impact of the disease could be determined only by extensive surveillance (1).

Consequently, the division of communicable diseases, Pennsylvania Department of Health, set up a statewide influenza surveillance system to delineate the extent of the outbreak in Pennsylvania, to facilitate early laboratory confirmation of suspected cases, and to elucidate the clinical and epidemiologic characteristics of influenza infections. The surveillance system was designed to monitor daily absenteeism in representative schools and industrial plants and to make such information readily available to laboratories and clinical institutions. This report deals primarily with the design and opera-

tion of the reporting system. The epidemiologic, clinical, pathological, and laboratory aspects of the influenza epidemic will be discussed in detail elsewhere.

The Surveillance System

Design. After consultation with field and laboratory personnel, the division of communicable diseases established 13 surveillance sites in the State. Most of the sites were located at State health centers and were supervised by public health nurses. Several local institutions near each site agreed to furnish daily attendance figures. An effort was made to include at least one elementary school, one secondary school, and one industrial plant in the daily monitoring of absenteeism.

Surveillance sites were distributed so as to monitor the population in all six geographic areas of the State (fig. 1). However, Pittsburgh and Philadelphia had separate, municipally administered surveillance systems. Excluding these two cities, the total population under surveillance was 8,079,500 (2). Of this total, a sample of 101,613, or about 1.2 percent, was included in the daily absence monitoring. The geographic distribution of this sample, the number of reporting units, and the number of participating institutions are given in the table.

Operation. Monitoring of absenteeism began December 2, 1968, and ended January 31, 1969. During this period personnel at each surveillance site called the cooperating institutions every workday to obtain the number of absences

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for the same day. These data were usually obtained late in the morning or early in the afternoon. Each afternoon the central office of the communicable disease division in Harrisburg called each surveillance site to obtain the data collected earlier in the day.

Absence reports were reviewed daily. Institutions from which a noticeable increase in absenteeism was reported were usually called the following morning. If it appeared that the absenteeism could be attributed to influenza, the State laboratory was informed and specimens were obtained for laboratory studies. Efforts were also made to obtain clinical histories, autopsy protocols, and laboratory confirmations relating to all deaths ascribed to influenza.

Finally, the division of communicable diseases issued periodic reports on the status of influenza activity in Pennsylvania. The reports included daily number of absentees for each reporting institution, identification of areas with increased absenteeism, and the location of laboratory confirmed cases. This information was also correlated with the weekly influenza and pneumonia mortality figures for six metropolitan areas in the State. The reports were distributed to State

and Federal health units, medical schools, and hospitals. The reports were also made available to other organizations and institutions on request.

Results of Absenteeism Surveillance

Reports were received for 42 days in the period from December 2, 1968, through January 31, 1969. There were no reports for 19 days; 16 weekend days, two legal holidays (December 25 and January 1), and December 31 (a half workday for most State offices). In addition, because of the holiday recess, no data on absences were collected from elementary and secondary schools from December 23 through January 1.

Although 22 industrial plants participated, not all provided reports every day. Some had difficulty compiling and reporting the day's absences on the same day. Moreover, during the holiday season, reporting went untended when administrative personnel took short vacations. The low occurred on December 24, when absenteeism was reported for only six plants. The average number of industrial plants reporting per day was 15.6, or about 71 percent of those

Figure 1. Influenza surveillance sites, Pennsylvania, December 1968–January 1969

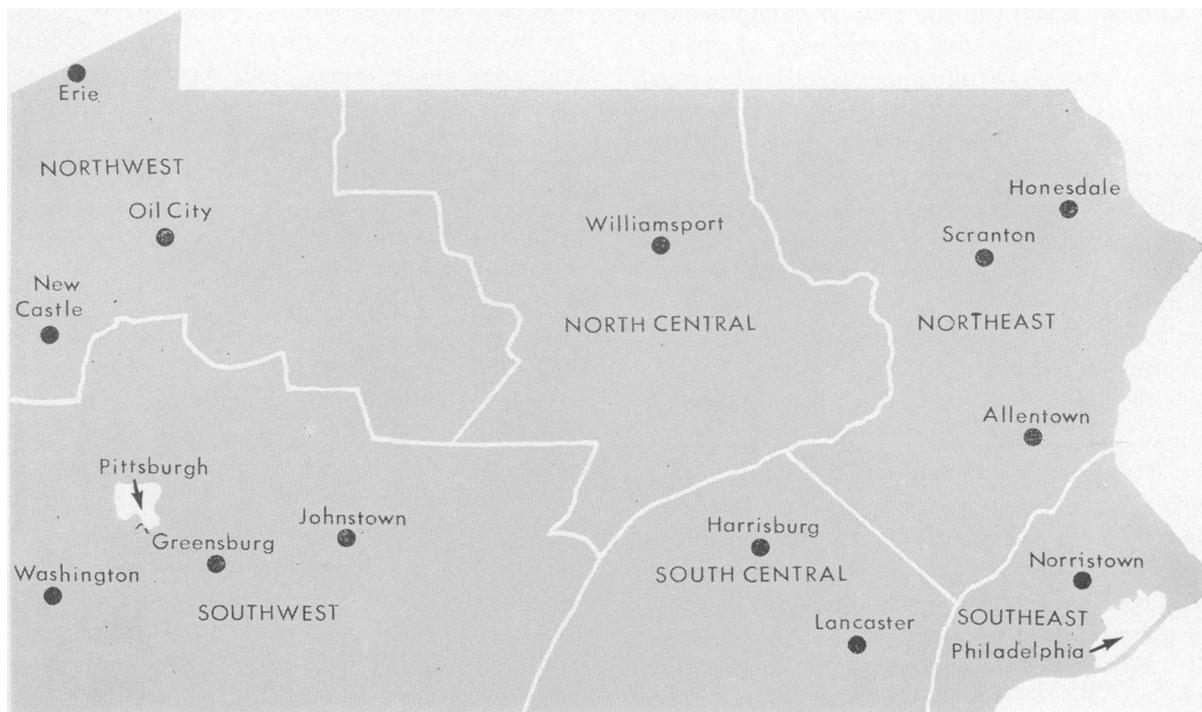
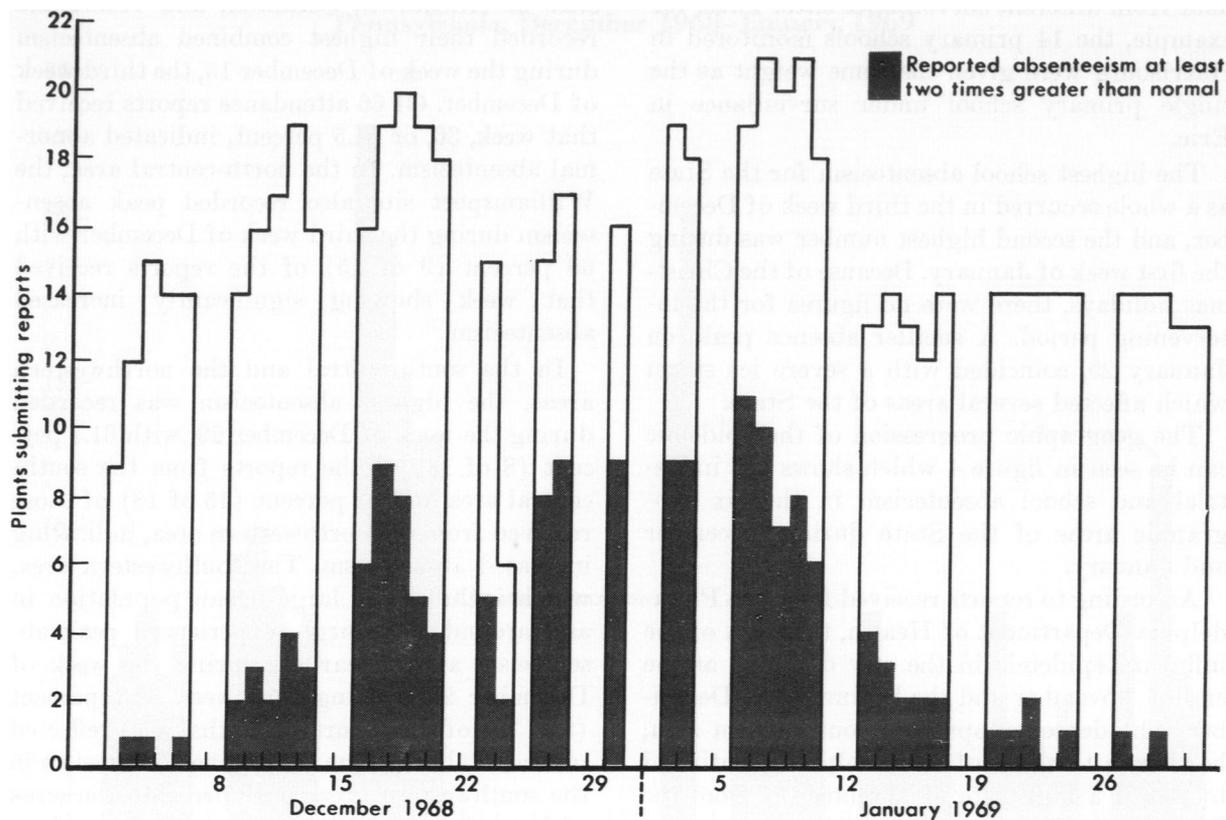


Figure 2. Industrial absenteeism in 22 plants, Pennsylvania, December 1968–January 1969



participating. By comparison, the average number of schools reporting per day was 57, or about 91 percent of the 63 participating.

Daily analysis of absence data was essential for early identification of areas with influenza activity. To facilitate rapid interpretation of absence figures, epidemic threshold levels were selected for the participating institutions. Because it was not possible to obtain baseline absenteeism figures for each of the participating schools, State averages were used. Excluding Philadelphia and Pittsburgh, the average absenteeism was about 5 percent per day in Pennsylvania's elementary and secondary schools during the 1967-68 school year. This information was obtained from the records of the division of statistics, Pennsylvania Department of Education. For rapid analysis of absence data, the epidemic threshold was arbitrarily set at 9 percent for all of the participating schools, approximately double the average absenteeism.

Although average numbers of absences were

supplied by all of the participating industrial plants, in many instances these figures were only rough estimates of the usual number of daily absences. Consequently, the epidemic threshold was set at twice the usual number of absences to lessen the possibility of a normal variation being interpreted as an unusual event.

Figure 2 shows, on a daily basis, both how many industrial plants submitted reports of absences and how many exceeded their epidemic threshold. The highest absenteeism was recorded on January 6, 1969, when 11 of 19 plants (57.9 percent) submitting reports on that day had an absenteeism rate at least twice as high as usual. A smaller peak of about 47 percent on December 17 coincided with the opening of the hunting season.

School absenteeism is shown in figure 3. Data from schools in close geographic proximity and in the same school districts were pooled. Once the information was pooled, information from each pool was presented as if it were from a single reporting unit (see table). The effect of

this procedure was to equalize the weight of data from different surveillance sites. Thus, for example, the 14 primary schools monitored in Harrisburg were given the same weight as the single primary school under surveillance in Erie.

The highest school absenteeism for the State as a whole occurred in the third week of December, and the second highest number was during the first week of January. Because of the Christmas holidays, there were no figures for the intervening period. A smaller absence peak, on January 29, coincided with a severe ice storm which affected several areas of the State.

The geographic progression of the epidemic can be seen in figure 4 which shows the industrial and school absenteeism in the six geographic areas of the State during December and January.

According to reports received from the Philadelphia Department of Health, the peak of the influenza epidemic in the city occurred at the end of November and the beginning of December. The densely populated southeastern area, bordering the city of Philadelphia, continued to report a high rate of absenteeism from the beginning of December through the first week of January. During that period, 20-50 percent of the reports received from that area indicated increased absenteeism.

In the northeastern area, the surveillance sites at Allentown, Scranton, and Honesdale recorded their highest combined absenteeism during the week of December 15, the third week of December. Of 66 attendance reports received that week, 36, or 54.5 percent, indicated abnormal absenteeism. In the north-central area, the Williamsport site also recorded peak absenteeism during the third week of December with 60 percent (9 of 15) of the reports received that week showing significantly increased absenteeism.

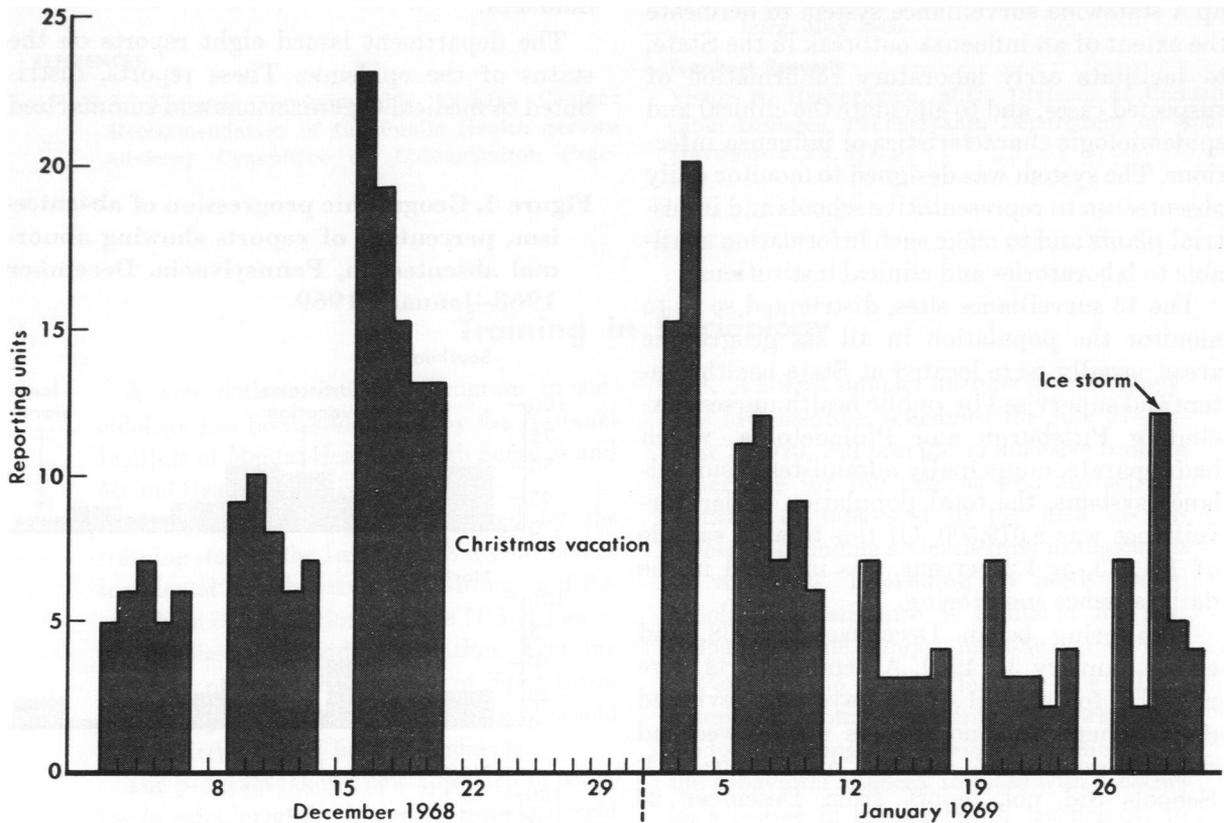
In the south-central and the northwestern areas, the highest absenteeism was recorded during the week of December 29, with 61.5 percent (8 of 13) of the reports from the south-central area and 83 percent (15 of 18) of those received from the northwestern area, indicating increased absenteeism. The southwestern area, which includes the large urban population in and around Pittsburgh, experienced peak absenteeism a week earlier, during the week of December 22. During that week 66.7 percent (8 of 12) of the reports from that area reflected increased absenteeism. Excessive absenteeism in the southwestern area continued into the week of December 29 with more than 58 percent (14 of 24) of the reported attendance showing increased absenteeism.

Thus, it appears that increased absenteeism

Number and population of participating institutions and reporting units reporting to influenza surveillance sites

| Surveillance sites | Primary schools | | | Secondary schools | | | Industries | |
|-----------------------|---------------------------|-------------------|----------------|---------------------------|-------------------|----------------|------------------|----------------|
| | Number of reporting units | Number of schools | Population | Number of reporting units | Number of schools | Population | Number of plants | Population |
| Norristown..... | 2 | 8 | 6, 872 | 2 | 3 | 5, 742 | 8 | 11, 432 |
| Allentown-Bethlehem.. | 2 | 2 | 1, 308 | 4 | 4 | 6, 890 | 2 | 16, 097 |
| Scranton..... | 1 | 1 | 343 | 1 | 1 | 1, 381 | 1 | 395 |
| Honesdale..... | 1 | 2 | 615 | 1 | 1 | 787 | 1 | 550 |
| Harrisburg..... | 1 | 14 | 6, 244 | 1 | 6 | 5, 562 | 2 | 4, 665 |
| Lancaster..... | 1 | 3 | 1, 330 | 1 | 3 | 4, 445 | | |
| Williamsport..... | 1 | 1 | 980 | 1 | 1 | 1, 910 | 1 | 408 |
| Johnstown..... | 1 | 1 | 749 | 1 | 1 | 2, 210 | 2 | 848 |
| Washington..... | | | | 1 | 1 | 1, 350 | 1 | 965 |
| Greensburg..... | 2 | 2 | 3, 878 | 1 | 1 | 1, 547 | 1 | 2, 300 |
| New Castle..... | 1 | 1 | 603 | 1 | 1 | 1, 985 | 1 | 511 |
| Oil City..... | 1 | 1 | 441 | 1 | 2 | 2, 089 | 1 | 475 |
| Erie..... | 1 | 1 | 575 | 1 | 1 | 2, 032 | 1 | 1, 099 |
| Total..... | 15 | 37 | 23, 938 | 17 | 26 | 37, 930 | 22 | 39, 745 |

Figure 3. School absenteeism in 32 reporting units¹ with 9 percent or more absenteeism, Pennsylvania, December 1968–January 1969



¹ A reporting unit consists of one or more schools in a single school district.

in Pennsylvania first began in Philadelphia, spread rapidly to the southeast corner of the State, and then, almost sequentially, progressed first to the northeast and north-central portions and later to the south-central and western areas. Increased absenteeism, probably caused by influenza, crossed the State in about 5 weeks.

Identification of areas with probable influenza activity, based on increased absenteeism, facilitated collection of specimens for laboratory studies. The State laboratories made more than 700 isolations of virus similar to A₂/Hong Kong/68 influenza virus during the epidemic.

In the course of the epidemic, the division of communicable diseases issued eight reports on the status of influenza activity in Pennsylvania. These reports were distributed to professional medical organizations and were summarized in the press. The reports alerted the public to the presence of the epidemic and stressed the need

for vaccinating persons in high-risk groups. The medical community's general awareness of the influenza problem was evidenced by the reporting of 26 deaths followed by post mortem examinations during which virus was isolated from lung tissue.

Conclusion

A statewide surveillance system can be readily instituted to document influenza activity. Daily institutional absenteeism not only provides insight into the magnitude of the epidemic and its geographic distribution and progression, but also facilitates early laboratory documentation of influenza activity. Finally, distribution of surveillance reports to local medical institutions provides clinical personnel with current epidemiologic information and promotes reporting of unusual clinical and pathological features of the illness.

Summary

The Pennsylvania Department of Health set up a statewide surveillance system to delineate the extent of an influenza outbreak in the State, to facilitate early laboratory confirmation of suspected cases, and to elucidate the clinical and epidemiologic characteristics of influenza infections. The system was designed to monitor daily absenteeism in representative schools and industrial plants and to make such information available to laboratories and clinical institutions.

The 13 surveillance sites, distributed so as to monitor the population in all six geographic areas, usually were located at State health centers and supervised by public health nurses. Excluding Pittsburgh and Philadelphia, which had separate, municipally administered surveillance systems, the total population under surveillance was 8,079,500. Of this total, a sample of 101,613, or 1.2 percent, was included in the daily absence monitoring.

Monitoring began December 2, 1968, and ended January 31, 1969. Absence reports were received for a total of 42 days and reviewed daily. There were no reports for 16 weekend days, December 25 and 31, and January 1. Schools did not report from December 23 through January 1. Daily reports were received from 15 reporting units comprising 37 primary schools with a population of 23,938, and 17 units comprising 26 secondary schools with a population of 37,930. The total of 22 plants reporting had a population of 39,745.

The average number of plants reporting was 15.6 per day, or about 71 percent of those participating. The average number of schools reporting per day was 57, or about 91 percent of the 63 participating.

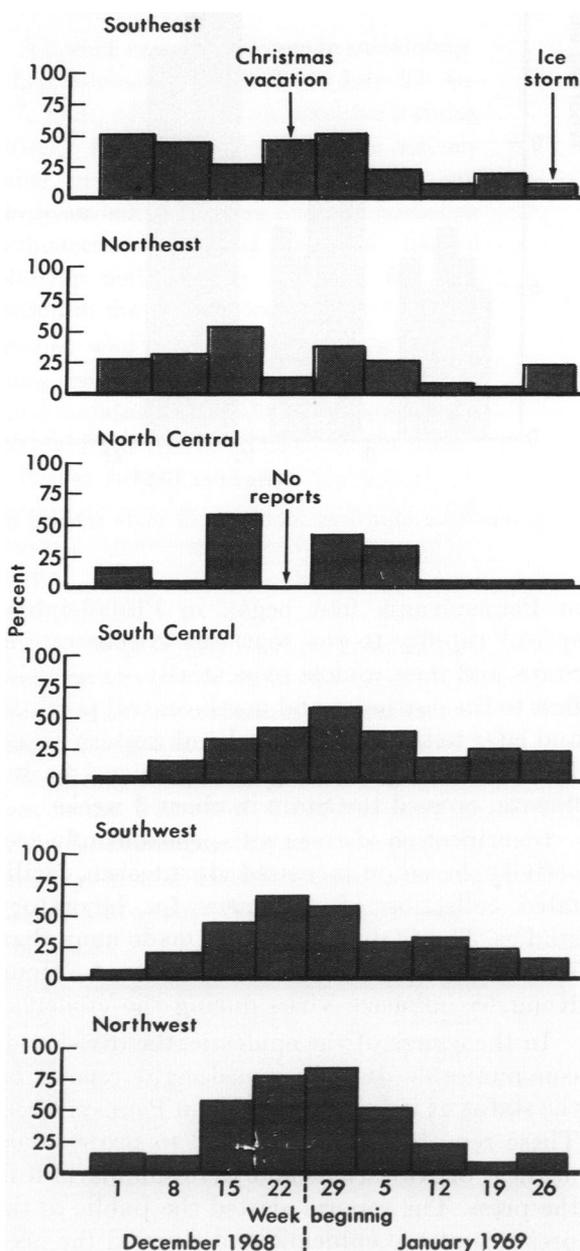
Increased absenteeism, probably caused by influenza, crossed the State in about 5 weeks. Beginning in Philadelphia, absenteeism spread rapidly to the southeast corner of the State, and then almost sequentially progressed first to the northeast and north-central portions and later to the south-central and western areas.

Identification of areas with probable influenza activity facilitated collection of specimens for laboratory studies. State laboratories made more than 700 isolations of virus similar to A₂/Hong Kong/68 influenza virus during the

epidemic. As a result of autopsies, 26 deaths were confirmed by viral studies as due to influenza.

The department issued eight reports on the status of the epidemic. These reports, distributed to medical organizations and summarized

Figure 4. Geographic progression of absenteeism, percentage of reports showing abnormal absenteeism, Pennsylvania, December 1968–January 1969



in the press, alerted the public to the presence of the epidemic and stressed the need for vaccinating persons in high-risk groups.

REFERENCES

- (1) U.S. National Communicable Disease Center: Recommendation of the Public Health Service Advisory Committee on Immunization Prac-

tices. *Morbidity and Mortality Weekly Report*, vol. 17, No. 35, Aug. 31, 1968, p. 323.

- (2) Provisional population estimate for the year 1968. Pennsylvania State Planning Board, Harrisburg, May 1969.

Tearsheet Requests

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Training in Suicidology

A new national training program in suicidology has been announced by the National Institute of Mental Health, Health Services and Mental Health Administration.

The program is being conducted by the training staff of the Institute's National Center for Mental Health Services, Training, and Research, in collaboration with the NIMH Center for Studies of Suicide Prevention. Training will take place on the grounds of Saint Elizabeths Hospital in the District of Columbia and in a variety of local field assignments.

The program takes a new approach to training in suicidology by including three different courses of varying lengths and emphases, in order to meet the individual needs of a wide variety of potential trainees and to prepare them for many kinds and levels of activities in suicide prevention, crisis intervention, and emergency mental health care. The three courses are:

1. A full year of interdisciplinary graduate training in suicidology. One-year fellowships are available to begin training in September 1970. Fellowships range from \$6,500 to \$12,000, depending on prior training experience.

2. Ten weeks of training in a special area of suicidology: (a) evaluation and treatment of suicidal persons, (b) education, training, and consultation, (c) research, and (d) community services and administration. Stipends for the 10-week sessions range from \$1,200 to \$2,400. Selected trainees may attend more than one term.

3. A 2-week summer institute in suicidology. The first institute, scheduled for July 27–August 7, 1970, will provide an intensive training experience for 150 persons who are actively working or interested in the field of suicidology, including all levels from professionals to volunteers. Depending on need, limited scholarship assistance is available for participation in the summer institute.

Persons who qualify for the new NIMH training programs range from those with post-doctoral training in a clinical profession or in the behavioral sciences, to those with a bachelor's degree in mental health technology, to volunteers in suicide prevention centers and community "gatekeepers" such as physicians, educators, pharmacists, clergymen, and policemen.

In addition to NIMH staff, professionals in appropriate disciplines from the District of Columbia area and recognized leaders in suicidology throughout the country will participate in giving the training. Community resources in the District of Columbia, such as the Suicide Prevention Center, the Area D Community Mental Health Center, and the American University "College Crisis Line" will be used.

Further information and applications are available from Henry Lederer, M.D., "Training in Suicidology," National Center for Mental Health Services, Training, and Research, National Institute of Mental Health, 2700 Nichols Avenue, S.E., Washington, D.C. 20032.